File

ANACONDA

INTER-OFFICE CORRESPONDENCE

To: MARY O'NEILL **Date:** April 4, 1979

From: J.K. GRUNIG **Subject:** HYDRAULIC MINING TEST
LAGUNA LEASE

The U.S. Bureau of Mines has developed a new wrinkle on an old mining method used by the California miners in the 1850's. They used high pressure water jets to break up gravel for recovery of gold. The U.S.B.M. method uses a very high pressure water jet to errode uranium sandstone. The U.S.B.M. proposes to drill a well into uranium sandstone, to errode the sandstone with plain water using a high pressure jet and, as it is mined, pump the resulting mixture of sandstone and water to the surface through the same hole. At the surface the water is removed from the sandstone and used again for mining. The uranium sandstone is shipped to the mill for processing. The method is called "hydraulic" or "bore hole slurry" mining. A copy of Technology News describing the mining method is attached, Exhibit 1.

The U.S.B.M. has asked industry to help them in this effort. We have agreed, subject of course to Tribal approval, to cooperate in this development. To develop the hydraulic mining method to a commercial level a series of field tests are required. To emphasize it's interest in these tests, the U.S.B.M. will send a representative from their Minneapolis office to discuss the tests with the Tribal Council at its meeting on April 16.

We propose two tests on the Laguna lease. The first test would be east of Paguate, about 1800 feet east of the highway. It is shown on Exhibit 2 as Test Location No. 1. The ground there has a gentle slope to the northwest. It is essentially undisturbed. We have drilled exploration holes there and outlined a small area of mineralized sandstone immediately below the Dakota

formation. We would drill a large well to the ore at a depth of about 150 feet and, using U.S.B.M. and rented equipment, mine a cavity about 50 feet in diameter and 6 feet high. The ore we mine would be accumulated in a lined pond about 100 feet by 100 feet. Please note the illustration on page 1 of Exhibit 1. After the test is finished and the mined ore is shipped, we would restore the pond area to its approximate original contour.

The second test would be at Location 2, see Exhibit 2. This is about 3000 feet west of the Anaconda Copper Company's employee housing. This location is now only slightly disturbed but is slated to be stripped for open pit mining of nearby ore. Thus, restoration of this site will be done as part of our overall mine restoration process. Here, too, the ore is at about 150 feet below the surface and a cavity about 50 feet in diameter and about 4 feet high would be excavated.

The two tests, if both are carried to planned diameter, should produce about 1200 tons of ore averaging about 0.2% U_3O_8 which would not otherwise be mined.

As we have pointed out, the U.S. Bureau of Mines is vitally interested in this test, but they also have other commitments for the equipment. Thus, we need immediate approval from the Governor of the Pueblo of Laguna if we are to accomplish this test before late fall.

With this approval, we would expect to start drilling the large diameter hole at Test Site No. 1 the week of April 16. The mining test at that site would start soon afterward. We should be finished by June 1st.

If hydraulic mining becomes a commercial reality, it would have an important impact on mining on the Laguna lease. There is a large amount of uranium within the area we have leased from the Laguna Tribe for which there is no economic mining method at today's prices. Hydraulic mining is a possible method of extracting this subgrade uranium. If it is successfully developed and is applied to the Laguna lease ores, royalty revenues from ore not in present mining plans amounting to perhaps ten million dollars could accrue to the Laguna tribe. In addition, the method offers the possibility of extension of mining to areas not now under lease in which currently uneconomic uranium occurrences are known to exist.

After mining the surface would be left at its original contour, except in hilly areas where some site leveling would be required. The method should allow the possibility of mining under archeological sites without distrubing them.

For this test, and for commercial mining, local water would be used and reused for mining. No acids or other noxious chemicals would be used and no contamination of the Jackpile sandstone as an aquifer is expected. In addition, because the cavity will be kept drained during mining, a small amount of water will leak into these cavities at or below water level during mining. In this way, any mixing of mining water with local groundwater would be prevented.

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